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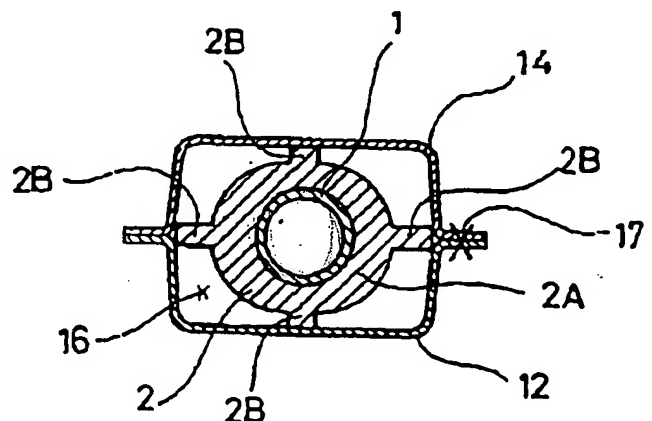
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(54)【考案の名称】 中空網造物における発泡性材料の取り付け構造及び発泡性材料の取り付け用加工体

(57) 【要約】

【目的】 車両ピラー等の中空構造物に強度を付与することのできる防音及び制振用発泡性材料の取り付け加工体及び発泡性材料の取り付け構造を提供する。

【構成】 金属製パイプ形状の芯部材 1 を発泡性材料 2 の略中心位置に有してなる発泡性材料の取り付け用加工体を、内部ピラー部分 1 2 の周囲壁に対して三個の支持部 2 B を垂直に置き、取り付けした後、内部ピラー部分 1 2 を外部ピラー部分 1 4 にスポット溶接 1 7 により固定し、ピラーを組み立てることにより発泡性材料の取り付け構造を得る。加熱により発泡性材料 2 は発泡し、中空部 1 6 内に発泡体が満たされる。この発泡体はその中心内部に金属製パイプ形状の芯部材 1 を有するのでピラーに強度が付与される。



【図１】実施例１の発泡性材料の取り付け構造を示す断

1	芯部材
2	発泡性材料
2 B	支持部
3	芯部材
4	発泡性材料
S	支持部
1 6	中空部

PAGE. 03

【0001】

【産業上の利用分野】

本考案は、中空構造物における発泡性材料の取り付け構造及び発泡性材料の取り付け用加工体に関し、詳しくは車両用ビラー等の中空構造物内の所定部位に配置し、その部位で発泡させて、中空部を遮断して防音及び制振等の効果を発揮させるための発泡性材料の取り付け構造及び発泡性材料の取り付け用加工体であって、さらに前記中空構造物に強度を付与することができるものに関する。

【0002】

【従来の技術】

この種の発泡性材料の従来の取り付け構造は、図6に示すように内部ビラー部分12と外部ビラー部分14にて形成される中空部16に内部ビラー部分12の外側から挿通したねじ11にワッシャー15を介して発泡性材料10を差し込んだ状態とされ、発泡性材料10は内部ビラー部分12の外側から挿通したねじ11により固定されていた。固定した発泡性材料10は外部からの加熱により、発泡させ、ビラー内部の中空部16を満たしたものとなし、中空部16を満たす発泡体により、ビラーに防音及び制振効果を付与するようにしている。

なお、図6において13は内部ビラー部分12と外部ビラー部分14を組み付け固定するボルト締め部である。

【0003】

【考案が解決しようとする課題】

しかし従来の発泡性材料10は単にねじ11がその中央部分において差し込まれているのみであり、加熱により、発泡した場合にビラー内部の中空部16に満たされる発泡体は強度が小さく、ビラー等の中空構造物に強度を付与することはできなかった。

そこで本考案の課題は、車両ビラー等の中空構造物に防音及び制振等の効果とともに強度を付与することのできる発泡性材料の取り付け構造、及びその構造となすための発泡性材料の取り付け用加工体を提供することにある。

【0004】

上記課題解決のために本考案の発泡性材料の構造は、中空構造物の中空部に配置し、発泡させ、補強用の芯部材を含んで、中空部を遮断する発泡体を形成する発泡性材料の取り付け構造であって、前記発泡性材料は前記中空構造物の長手方向に対応する剛性及び耐熱性の芯部材の外側に取り付けられ、かつ芯部材が、中空部の所定位置に位置するように中空部内に挿入支持されてなることを特徴とし、本考案の発泡性材料の取り付け用加工体は、中空構造物の中空部に配置し、発泡させ、補強用の芯部材を含んで、中空部を遮断する発泡体を形成する発泡性材料を前記中空部に取り付けるための取り付け用加工体であって、前記発泡性材料は前記中空構造物の長手方向に対応する剛性及び耐熱性の芯部材の外側に取り付けられ、かつ芯部材を中空部に挿入した際は中空部の所定位置に芯部材が位置するように発泡性材料が設けられていることを特徴とする。

【0005】

#### 【作用】

上記構成の発泡性材料の取り付け加工体及び発泡性材料の取り付け構造によれば、加熱により発泡性材料を発泡させた場合、中空構造物の中空部内に満たされる発泡体はその内側に中空構造物の長手方向に対応する剛性の芯部材を有するので中空構造物に強度が付与される。

【0006】

#### 【実施例】

##### 実施例1

本考案の第一実施例を図1～図3に基づいて説明する。

図1は、車両ピラー内部の中空部16内に本例1の発泡性材料の取り付け用加工体を取り付けた本例1の発泡性材料の取り付け構造の図であり、加熱前で発泡性材料が未発泡の状態を示す。

本例1の発泡性材料の取り付け加工体は図2に示されるように、パイプ形状の金属製の芯部材1の外側に発泡性材料2を層状に被着してなるものである。この芯部材1と発泡性材料2とは発泡性材料2の成型時において一体化されている。発泡性材料2の形状は、芯部材1の外周全体に渡って一定の肉厚を有した円形層

体形状の支持部 2 B を突設した形状に形成されている。円柱形状の芯部材 1 の長さは本例 1 の発泡性材料の取り付け加工体に取り付けられるピラーの長さとも一致させてもよく、又はピラーの長さよりも短い長さを有する芯部材 1 を複数個、ピラーの長手方向に連続して取り付け使用しても良い。ピラーが直線形状ではない場合には後者の使用方法を用いると良い。

#### 【0007】

本例 1 の発泡性材料の取り付け用加工体を車両ピラーの中空部 1 6 内に取り付け、本例 1 の発泡性材料の取り付け構造は外部から加熱し、発泡性材料 1 0 を発泡させる。生じた発泡体がピラーの中空部 1 6 を満たし硬化した状態は図 3 に示すごとくである。図 3 は車両ピラーの中空部 1 6 において芯部材 1 と中空部 1 6 内壁間が硬化した発泡体にて満たされた状態を示している。

発泡体によりピラーの中空部 1 6 内は全てを満たしても良く、または部分的に満たしても良く、この両場合において発泡体がピラーの中空部 1 6 を遮断することとなる。

#### 【0008】

##### 実施例 2

次に、本発案の第二実施例を図 4 及び図 5 に基づいて説明する。

図 4 は、車両ピラー内部の中空部 1 6 に本例 2 の発泡性材料の取り付け加工体を取り付けた本例 2 の発泡性材料の取り付け構造の図であって、加熱前の発泡性材料が未発泡の状態を示す。

本例 2 の発泡性材料の取り付け用加工体は図 5 に示されるように、その断面が H 形状である長手方向に延在された金属製の芯部材 3 の外面に発泡性材料 4 が層状に取り付けられている。この芯部材 3 と発泡性材料 4 とは発泡性材料 4 の成型時において一体化されている。発泡性材料 4 の形状は断面が H 形状である金属製の芯部材 3 の外面全体に一定の肉厚に形成され、その全体の断面形状は金属製の芯部材 3 を中心とする略 H 字型である。すなわち発泡性材料 4 は二個の直方体で板形状の平面部分 4 A、4 A を略平行位置に有し、これらの平面部分 4 A、4 A の間に平面部分 4 A、4 A に対して略垂直に、かつ連続して直方体の柱部分 4 B

て設け、この取り付け加工体が中空部 16 に取り付けられた際に芯部材 3 が所定の中央位置に配置されるようにされている。なお、支持部 S は長手方向に沿って設けても良く、部分的に設けても良い。芯部材 3 の長手方向の長さは本例 2 の発泡性材料の取り付け加工体に取り付けられるピラーの長さとも一致させてもよく、又はピラーの長さよりも短い長さを有する芯部材 3 を複数個、ピラーの長手方向に連続して取り付け使用しても良い。ピラーが直線形状ではない場合には後者の使用方法を用いると良い。

本例 1 及び本例 2 の発泡性材料 2 及び 4 としては特開平 2-276836 に記載の配合の材料を使用した。この材料は 110℃～190℃の温度で同時に発泡及び硬化でき、独立気泡発泡体を与えることを特徴とする。なお、発泡性材料は外部加熱によって発泡する発泡体を広く採用することができる。

【0009】

本例 1 又は本例 2 の発泡性材料の取り付け加工体を車両ピラーの中空部 16 に取り付ける際には、支持部 2B 又は支持部 S を、内部ピラー部分 12 上の所定位置に置いた後、内部ピラー部分 12 を外部ピラー部分 14 にスポット溶着 17 により固定し、ピラーを組み立てる。これにより、本例 1 又は本例 2 の発泡性材料の取り付け構造が得られる。

この取り付けの場合、本例 1 の発泡性材料の取り付け加工体においては、内部ピラー部分 12 の周囲内面に対して垂直に三個の支持部 2B を置き、又は本例 2 の発泡性材料の取り付け加工体においては、同じ平面部分 4A の両端の二個の支持部 S を内部ピラー部分 12 の底面上に置けば、芯部材 1 又は芯部材 3 が中空部 16 の中央位置に位置決めされる。

なお芯部材 1 又は芯部材 3 の位置決めは発泡性材料 2 又は発泡性材料 4 に予め磁石片を取りつけて、内部ピラー部分 12 に磁着させて取り付けても良く、または従来の様にボルトを用いて円形周部分 2A 又は平面部分 4A を内部ピラー部分 12 上に取り付けても良い。この場合は支持部 2B 又は支持部 S を設ける必要はなく、芯部材 1 及び芯部材 3 をピラーの中空部 16 の略中心位置において長手方向に延在された状態に設置させ得る。この後、同様に内部ピラー部分 12 を外部

てゐる。

#### 【0010】

本例1及び本例2の発泡性材料2及び4の形状はピラーを組み立てた場合において、発泡性材料2及び発泡性材料4の支持部2R及び支持部Sが中空部16における周囲金属壁に対して直接、接する形状とされている。従って、外部からの加熱による熱が発泡性材料2及び発泡性材料4に伝達されやすいという利点がある。

#### 【0011】

本例1及び本例2の発泡性材料2及び発泡性材料4は加熱により発泡し、ピラー内部の中空部16を満たすことにより、ピラーに防音及び制振効果等を付与する。この発泡は車両の加熱塗装時の加熱（約160℃）により生じるので、特別に加熱工程を設ける必要はなく便利である。

そして発泡後の本例1及び本例2の発泡性材料の取り付け加工体及び発泡性材料の取り付け構造は、発泡性材料2及び4の内部にピラーの長手方向に延在された剛性の各々芯部材1及び芯部材3を有するので、ピラーに強度が付与され、さらに、この状態において、芯部材1及び芯部材3はピラー内部の中空部の略中心位置に存在するので、芯部材1及び芯部材3によるピラーへの強度が付与がより効率良くなされる。

なお本実施例においては車両ピラーに本考案の発泡性材料の取り付け加工体を使用する場合について説明したが、車両ピラー以外にも他の中空構造物の中空部に本考案の発泡性材料の取り付け加工体を使用することができ、本考案の発泡性材料の取り付け構造を得ることができ、加熱により発泡性材料を発泡させて、防音、制振、防水等の効果を得ることができる。

#### 【0012】

##### 【考案の効果】

本考案の発泡性材料の取り付け加工体及び発泡性材料の取り付け構造によると前記中空構造物の長手方向に延在された剛性及び耐熱性の芯部材の外側に発泡性材料を取り付けてあるので、加熱して発泡性材料を発泡させた場合、中空構造物



中空構造物の長手方向に延在された剛性の芯部材により中空構造物に強度が付与される。

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[Utility model registration claim]

[Claim 1] It is made to arrange and foam to the centrum of the hollow structure, and is the core part material for reinforcement. It is the installation structure of the foaming nature material which insertion support is carried out into a centrum and characterized for a bird clapper by things so that it contains, and it may be the installation structure of the foaming nature material which forms the foam which intercepts a centrum, and the aforementioned foaming nature material may be attached in the outside of the rigid and heat-resistant core part material which extended in the longitudinal direction of the aforementioned hollow structure and core part material may be located in the predetermined position of a centrum.

[Claim 2] It is made to arrange and foam to the centrum of the hollow structure, and is the core part material for reinforcement. It is an attaching processing object for attaching in the aforementioned centrum the foaming nature material which forms the foam which contains and intercepts a centrum. The aforementioned foaming nature material is the attaching processing object of the foaming nature material characterized by preparing foaming nature material so that core part material may be located in the predetermined position of a centrum, when it is attached in the outside of the rigid and heat-resistant core part material corresponding to the longitudinal direction of the aforementioned hollow structure and core part material is inserted in a centrum.

[Detailed explanation of a design]

[0001]

[Industrial Application]

This design is related with the installation structure of the foaming nature material in the hollow structure, and the attaching processing object of foaming nature material. Arrange to the predetermined part in the hollow structures, such as a pillar for vehicles, in detail, and it is made to foam by the part. It is the installation structure of the foaming nature material for intercepting a centrum and demonstrating effects, such as sound isolation and damping, and the attaching processing object of foaming nature material, and is related with what can give intensity further to the aforementioned hollow structure.

[0002]

[Description of the Prior Art]

The conventional installation structure of this kind of foaming nature material was made into the state inserted in the centrum 16 formed in the internal pillar portion 12 and the external pillar portion 14 from the outside of the internal pillar portion 12 where \*\*\*\*ed and the foaming nature material 10 was inserted in 11 through the washer 15 as shown in drawing 6 , and the foaming nature material 10 was being fixed with the screw thread 11 inserted in from the outside of the internal pillar portion 12. It is made for the fixed foaming nature material 10 to give sound isolation and the damping effect to a pillar by the foam which fills what was made to foam and filled the centrum 16 inside a peeler, nothing, and a centrum 16 by heating from the outside. In addition, in drawing 6 , 13 is the bolting section which attaches the internal pillar portion 12 and the external pillar portion 14, and is fixed.

[0003]

[Problem(s) to be Solved by the Device]

However, when the conventional foaming nature material 10 was [ that the screw thread 11 is only inserted in a part for the center section, and ] and foamed by heating, the foam filled by the centrum 16 inside a peeler had small intensity, and intensity was not able to be given to the hollow structures, such as a pillar.

Then, the technical problem of this design is to offer the attaching processing object of the foaming nature material for making with the installation structure of the foaming nature material which can give intensity to the hollow structures, such as a vehicles pillar, with effects, such as sound isolation and damping, and its structure.

[0004]

[Means for Solving the Problem]

For the above-mentioned technical-problem solution, the structure of the foaming nature material of this design Make it arrange and foam to the centrum of the hollow structure, and the core part material for reinforcement is included. It is the installation structure of the foaming nature material which forms the foam which intercepts a centrum. The aforementioned foaming nature material is attached in the outside of the rigid and heat-resistant core part material corresponding to the longitudinal direction of the aforementioned hollow structure. Insertion support is carried out into a centrum and core part material is characterized by the bird clapper so that it may be located in the predetermined position of a centrum. and the attaching processing object of the foaming nature material of this design Make it arrange and foam to the centrum of the hollow structure, and the core part material for reinforcement is included. It is an attaching processing object for attaching in the aforementioned centrum the foaming nature material which forms the foam which intercepts a centrum. When the aforementioned foaming nature material is attached in the outside of the rigid and heat-resistant core part material corresponding to the longitudinal direction of the aforementioned hollow structure and core part material is inserted in a centrum, it is characterized by preparing foaming nature material so that core part material may be located in the predetermined position of a centrum.

[0005]

[Function]

According to the installation processing object of the foaming nature material of the above-mentioned composition, and the installation structure of foaming nature material, when foaming nature material is made to foam by heating, since the foam

filled in the centrum of the hollow structure has the rigid core part material corresponding to the longitudinal direction of the hollow structure in the inside, intensity is given to the hollow structure.

[0006]

[Example]

Example 1 The first example of this design is explained based on drawing 1 - drawing 3 .

It is drawing of the installation structure of the foaming nature material of this example 1 which attached the attaching processing object of the foaming nature material of this example 1 in the centrum 16 inside a vehicles peeler, and it is before heating and, as for drawing 1 , foaming nature material shows the state where it does not foam.

The foaming nature material 2 is put on the outside of the metal core part material 1 of a pipe configuration in layers, and the installation processing object of the foaming nature material of this example 1 becomes it, as shown in drawing 2 . This core part material 1 and the foaming nature material 2 are unified at the time of molding of the foaming nature material 2.

The configuration of the foaming nature material 2 is formed in the configuration which protruded supporter 2B of the rectangular parallelepiped configuration of four places on the position which touches perpendicularly circular layer part 2A with fixed thickness to the centrum 16 of a vehicles pillar over the whole periphery of the core part material 1. The length of the cylindrical shape-like core part material 1 may follow the longitudinal direction of a pillar, and may attach and use for it two or more core part material 1 which may be made in agreement with the length of the pillar in which the installation processing object of the foaming nature material of this example 1 is attached, or has length shorter than the length of a pillar. When a pillar is not linear [-like ], it is good to use the latter operation.

[0007]

The installation structure of the foaming nature material of this example 1 which

attached the attaching processing object of the foaming nature material of this example 1 in the centrum 16 of a vehicles pillar is heated from the outside, and the foaming nature material 10 is made to foam in it. It seems that the state where the produced foam filled and hardened the centrum 16 of a pillar is shown in drawing 3. Drawing 3 shows the state where it was filled with the foam which between the core part material 1 and the centrum 16 wall hardened in the centrum 16 of a vehicles pillar.

The inside of the centrum 16 of a pillar may fill all by the foam, or you may fill partially, and a foam will intercept the centrum 16 of a pillar in both this \*\*\*\*.

[0008]

Example 2 Next, the second example of this design is explained based on drawing 4 and drawing 5.

It is drawing of the installation structure of the foaming nature material of this example 2 which attached the installation processing object of the foaming nature material of this example 2 in the centrum 16 inside a vehicles peeler, and, as for drawing 4, the foaming nature material before heating shows the state where it does not foam.

As the attaching processing object of the foaming nature material of this example 2 is shown in drawing 5, the foaming nature material 4 is attached in the superficies of the metal core part material 3 which extended in the longitudinal direction the cross section of whose is H configuration in layers. This core part material 3 and the foaming nature material 4 are unified at the time of molding of the foaming nature material 4. The configuration of the foaming nature material 4 is formed in thickness fixed on the whole superficies of the metal core part material 3 whose cross section is H configuration, and the cross-section configuration of the whole is the abbreviation type for H characters centering on the metal core part material 3. namely, the foaming nature material 4 -- two rectangular parallelepipeds -- the flat-surface portions 4A and 4A of a board configuration -- an abbreviation parallel position -- having -- between these flat-surface portions 4A and 4A -- the flat-surface portions 4A and 4A -- receiving

-- an abbreviation perpendicular -- and it has pillar section part 4B of a rectangular parallelepiped continuously flat-surface partial 4A -- the method of outside [ material / core part / 3 ] -- a protrusion -- Supporter S is formed continuously the bottom, and when this attaching processing object is attached in a centrum 16, it is made to be arranged at a mid gear predetermined in the core part material 3. In addition, Supporter S may be formed along with a longitudinal direction, and may be formed partially. The length of the longitudinal direction of the core part material 3 may follow the longitudinal direction of a pillar, and may attach and use for it two or more core part material 3 which may be made in agreement with the length of the pillar in which the installation processing object of the foaming nature material of this example 2 is attached, or has length shorter than the length of a pillar. When a pillar is not linear [-like ], it is good to use the latter operation.

As foaming nature material 2 and 4 of this example 1 and this example 2, the material of combination of a publication was used for JP,2-276836,A. This material can be simultaneously foamed and hardened at the temperature of 110 degrees C - 190 degrees C, and it is characterized by giving a closed-cell foam. In addition, foaming nature material can adopt widely the foam to which it foams by heat tracing.

[0009]

In case the installation processing object of the foaming nature material of this example 1 or this example 2 is attached in the centrum 16 of a vehicle's pillar, after putting supporter 2B or Supporter S on the predetermined position on the internal pillar portion 12, the internal pillar portion 12 is fixed to the external pillar portion 14 by the spot welding 17, and a pillar is assembled. Thereby, the installation structure of the foaming nature material of this example 1 or this example 2 is acquired.

In this installation, it sets on the installation processing object of the foaming nature material of this example 1. Place three supporter 2Bs perpendicularly to the circumference inside of the internal pillar portion 12, or it sets on the installation processing object of the foaming nature material of this example 2. If two supporters S of the ends of the same flat-surface partial 4A are placed on the base of the internal

pillar portion 12, the core part material 1 or the core part material 3 will be positioned by the mid gear of a centrum 16.

In addition, positioning of the core part material 1 or the core part material 3 attaches the piece of a magnet in the foaming nature material 2 or the foaming nature material 4 beforehand, it may carry out \*\* arrival to the internal pillar portion 12, and it may attach it, or may attach circular layer part 2A or flat-surface partial 4A on the internal pillar portion 12 using a bolt like the former. In this case, it is not necessary to form supporter 2B or Supporter S, and the core part material 1 and the core part material 3 may be made to install in the state where it extended in the longitudinal direction in the abbreviation center position of the centrum 16 of a pillar. Then, a pillar is assembled by fixing the internal pillar portion 12 to the external pillar portion 14 by the spot welding 17 similarly.

[0010]

The configuration of the foaming nature material 2 and 4 of this example 1 and this example 2 is directly made into the touching configuration to the circumference metal wall [ in / a centrum 16 / in supporter 2B and Supporter S of the foaming nature material 2 and the foaming nature material 4 ], when a pillar is assembled. Therefore, there is an advantage that the heat by heating from the outside is easy to be transmitted to the foaming nature material 2 and the foaming nature material 4.

[0011]

The foaming nature material 2 and the foaming nature material 4 of this example 1 and this example 2 give sound isolation, the damping effect, etc. to a pillar by foaming by heating and filling the centrum 16 inside a peeler. Since it is generated by heating at the time of heating paint of vehicles (about 160 degrees C), this foaming does not need to establish a heating process specially and is convenient.

And the installation processing object of the foaming nature material of this example 1 after foaming, and this example 2 and the installation structure of foaming nature material Since the rigidity which extended in the longitudinal direction of a pillar reaches respectively the interior of the foaming nature material 2 and 4 core part



material 1 and it has the core part material 3 Since intensity is given to a pillar and the core part material 1 and the core part material 3 exist in the abbreviation center position of the centrum inside a peeler in this state further, grant is made more efficiently [ the intensity to the pillar by the core part material 1 and the core part material 3 ].

In addition, although the case where the installation processing object of the foaming nature material of this design is used for a vehicles pillar in this example explains, the installation processing object of the foaming nature material of this design can use for the centrum of other hollow structures besides a vehicles pillar, the installation structure of the foaming nature material of this design can acquire, and can make foaming nature material foam by heating, and effects, such as sound isolation, damping, and waterproofing, can acquire.

[0012]

[Effect of the Device]

Since foaming nature material is attached in the outside of the rigid and heat-resistant core part material which extended in the longitudinal direction of the aforementioned hollow structure according to the installation processing object of the foaming nature material of this design, and the installation structure of foaming nature material Intensity is given to the hollow structure by the rigid core part material which extended in the longitudinal direction of the hollow structure, while acquiring effects, such as sound isolation, damping, and waterproofing, by the foam filled by the centrum inside the hollow structure, when it heats and foaming nature material is made to foam.

[Brief Description of the Drawings]

[Drawing 1] It is the cross section showing the installation structure of the foaming nature material of an example 1.

[Drawing 2] It is structural drawing of the installation processing object of the foaming nature material in an example 1.

[Drawing 3] It is the state diagram of a foam which filled the centrum of a pillar in the

example 1.

[Drawing 4] It is the cross section showing the installation structure of the foaming nature material of an example 2.

[Drawing 5] It is structural drawing of the installation processing object of the foaming nature material in an example 2.

[Drawing 6] It is the cross section showing the installation state of the conventional foaming nature material.

[Description of Notations]

1 Core Part Material

2 Foaming Nature Material

2B Supporter

3 Core Part Material

4 Foaming Nature Material

S Supporter

16 Centrum

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(54) MOLDED EXPANDABLE COMPONENT AND COMPOSITION THEREFOR

(57)Abstract:

PURPOSE: To obtain a member which, when applied to the elongated hollow cavity inside a vehicle pillar, can expand in situ to adhere itself to the surrounding metal to prevent noise and moisture by compounding a base polymer containing a specified amount of methyl acrylate with a crosslinking agent and a blowing agent.

CONSTITUTION: This invention provides a member having a closed-cell foam obtained by simultaneously expanding and curing at 110-190-C a mixture prepared by mixing a base polymer containing at least 65 wt.% units derived from ethylene and an olefinically unsaturated methyl acrylate and having an MI of 0.1-6 and containing 10-40 wt.% methyl acrylate with a crosslinking agent, a chemical blowing agent and a blowing agent activator. The crosslinking agent used is exemplified by p-toluenesulfonyl hydrazide, and the blowing agent used is azodicarbonamide.

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## LEGAL STATUS

[Date of request for examination]

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